

CLAIMS

1. Gypsum dryer/calciner (1) comprising:

- a calcining space (2);

5 - a first pipe (4) exhibiting an inlet connected to a source of hot gases (3) and an outlet emerging in the calcining space (2);

- a second pipe (5) exhibiting an inlet connected to a source of gypsum (8) and an outlet emerging in the calcining space, the second pipe being concentric with the first pipe;

10 - a force-feeding screw (6) positioned at least partially in the second pipe, the said screw carrying the gypsum along in the calcining space.

2. Dryer/calciner according to Claim 1, characterized in that the second pipe surrounds the first pipe over a portion of its length.

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3. Dryer/calciner according to Claim 1, characterized in that the second pipe surrounds the first pipe over substantially its length.

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4. Dryer/calciner according to one of Claims 1 to 3, characterized in that the calcining space (2) corresponds to a receptacle (2a) at least partially surrounding the first pipe (4) and the second pipe (5).

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5. Dryer/calciner according to one of Claims 1 to 4, characterized in that the calcining space (2) is at least partially coincident with the inside of the second pipe (5).

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6. Dryer/calciner according to Claims 4 and 5, characterized in that the calcining space is divided up between the inside of the second pipe (5) and the receptacle (2a).

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7. Dryer/calciner according to Claim 5, characterized in that the calcining space is coincident with the inside of the second pipe (5).

8. Dryer/calciner according to one of the preceding claims, characterized in that the first pipe (4) is emplaced so as to rotate with respect to the second pipe (5) and drives the force-feeding screw (6) integral with it.

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9. Dryer/calciner according to one of the preceding claims, characterized in that the pitch of the screw varies along the length of the screw.

5 10. Dryer/calciner according to one of the preceding claims, characterized in that the screw exhibits a stirrer (11) positioned at the end of the screw.

11. Dryer/calciner according to Claim 10, characterized in that the force-feeding screw is guided in rotation by at least two centring arms integral with the stirrer (11).

10 12. Dryer/calciner according to Claim 10 or 11, characterized in that the stirrer (11) is equipped with a deflector (12) facing the outlet of the first pipe (4).

15 13. Dryer/calciner according to one of Claims 10 to 12, characterized in that the stirrer (11) exhibits a shaft positioned at its end.

14. Dryer/calciner according to one of Claims 10 to 13, characterized in that the stirrer (11) is guided in rotation by bearings integral with the receptacle (2a).

20 15. Dryer/calciner according to one of the preceding claims, characterized in that the pipes (4, 5) are vertical.

25 16. Dryer/calciner according to one of the preceding claims, characterized in that the inlet of the second pipe exhibits a conical shape corresponding at least partially to the force-feeding screw.

17. Dryer/calciner according to one of the preceding claims, characterized in that the second pipe (5) has a shape and structure appropriate for milling.

30 18. Dryer/calciner according to one of the preceding claims, characterized in that the force-feeding screw (6) has a shape and structure appropriate for milling.

19. Process for the calcining of gypsum, comprising the stages of:

- (i) supplying hot gases to the inlet of a first pipe;
- (ii) supplying gypsum to the inlet of a second pipe concentric with the first pipe;
- (iii) carrying the gypsum along in the second pipe via a force-feeding screw;

- (iv) indirect heat exchange between the gypsum and the hot gases; and
- (v) calcining the gypsum to plaster.

20. Process according to Claim 19, characterized in that the gypsum is gypsum
5 from flue gas desulphurization and/or natural gypsum.

21. Process according to Claim 19 or 20, characterized in that the stages (iii) of carrying the gypsum along and (iv) of indirect heat exchange comprise the drying of the gypsum.

10 22. Process according to one of Claims 19 to 21, characterized in that the stages (iii) of carrying the gypsum along and (iv) of indirect heat exchange comprise the drying and at least partially the calcining (v) of the gypsum to plaster.

15 23. Process according to one of Claims 19 to 22, characterized in that the calcining (v) comprises bringing the gypsum into contact with the hot gases, the calcining being of the flash type.

24. Process according to Claim 23, characterized in that the time between bringing the gypsum into contact and its complete calcining is less than 10 sec.

20 25. Process according to one of Claims 19 to 22, characterized in that the calcining (v) comprises bringing the gypsum into contact with the hot gases, the calcining being carried out in a fluidized bed.

25 26. Process according to one of Claims 19 to 25, characterized in that the calcining stage comprises transportation of the gypsum from the outlet of the second pipe by entrainment by hot gases.

30 27. Process according to one of Claims 19 to 26, characterized in that the residence time of the gypsum and/or plaster in the second pipe is between 30 seconds and 5 minutes.

28. Process according to one of Claims 19 to 22, characterized in that the stage of indirect heat exchange between the gypsum and the hot gases comprises the calcining stage.

35 29. Process according to one of Claims 19 to 22, characterized in that the stages (iii) of carrying the gypsum along and (iv) of indirect heat exchange comprise the drying

and at least partially the calcining (v) of the gypsum to plaster, the calcining (v) being completed by bringing the gypsum into contact with the hot gases, the completed calcining being of the flash type, the duration of the stages (iii) and (iv) being between 30 seconds and 5 minutes and the duration of the calcining by contact with the hot gases being
5 between 1 and 10 seconds.

30. Process according to Claim 29, the duration of the stages (iii) and (iv) being between 1 and 2 minutes and the duration of the calcining by contact with the hot gases being between 2 and 5 seconds.

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31. Process according to one of Claims 19 to 30, characterized in that it additionally comprises a stage (iiib) of milling the gypsum during the stage (iii) of carrying along.

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32. Process according to one of Claims 19 to 31, carried out in the dryer/calciner according to one of Claims 1 to 18.

33. Plaster capable of being obtained by the process of one of Claims 19 to 32.

34. Plaster, the characteristics of which are as follows:

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(i) reactivity:

- (a) knife initial set less than 6 minutes, preferably less than 5 minutes; and/or
- (b) Gillmore setting between 4.5 and 6 min; and/or
- (c) Vicat final set between 10 and 12 min; and

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(ii) plaster/water ratio at saturation of at least 140 parts of plaster per 100 parts of water; and

(iii) fluidity as determined by a spreading value of greater than 205, preferably of greater than 240, mm.

35. Plaster according to Claim 34, the characteristics of which are as follows:

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(i) reactivity: knife initial set less than 5 minutes; and

(ii) plaster/water ratio at saturation of at least 140 parts of plaster per 100 parts of water; and

(iii) fluidity as determined by a spreading value of greater than 240 mm.

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36. Plaster according to Claim 34 or 35, the BET surface area of which is at least 8 m²/g.

37. Plaster according to one of Claims 34 to 36, which does not split in water.
38. Plaster according to one of Claims 34 to 37, which is devoid of gypsum and/or
5 of chlorinated adjuvant.